



The Transformation of Library Management in Islamic University through Data-Driven Decision Making

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Abstract

Libraries in Islamic Higher Education Institutions (IHEIs) hold a strategic role as centers for scientific information resources, the strengthening of Islamic literacy, and primary support for both learning and research processes. However, the challenges of the digital era, shifting patterns of information consumption, and demands for accountability necessitate a transformation in library management. This paper explores the application of the Data-Driven Decision Making (DDDM) approach in the management of IHEI libraries. Through a conceptual framework and literature review, this study analyzes how data related to user behavior, collection circulation, digital service utilization, and academic needs can serve as the basis for more objective, adaptive, and needs-oriented decision-making processes. DDDM promotes a paradigm shift in library management from reactive to proactive, integrating information technology into evaluation and strategic planning processes. Findings indicate that the implementation of DDDM can enhance service effectiveness, collection relevance, user engagement, and support IHEIs' vision of producing academically and spiritually excellent graduates. This article also proposes implementation strategies, including the strengthening of library information systems, data literacy training for librarians, and the integration of libraries into digital academic systems. Therefore, data-based transformation becomes a crucial foundation for strengthening sustainable and future-oriented library management.

Keywords: Library Management; Islamic University; Data-Driven Decision Making; Digital Transformation; Innovative Strategy.

Introduction

State Islamic Higher Education Institutions (PTKIN) libraries occupy a strategic position in supporting academic activities, research, and the strengthening of Islamic literacy. In the Islamic tradition, literacy is not limited to the ability to read and write, but also encompasses the capacity to comprehend, analyze, and integrate knowledge with spiritual values. Since the revelation of the first

command “*Iqra*” in Surah Al-‘Alaq, the spirit of reading and processing information has become the foundational pillar of Islamic civilization. Consequently, libraries within PTKIN are not merely information providers; they are integral to the mission of Islamic education, which unites academic, moral, and spiritual dimensions (Rahman et al., 2023): (Saragih, 2025).

Nevertheless, the digital era has brought about significant changes in information consumption patterns. Students and lecturers now rely more heavily on digital sources than traditional print collections. This shift demands a radical transformation in library management. Digital technologies, artificial intelligence, big data, and user behavior analytics have become essential instruments to ensure that library services remain relevant and adaptable to contemporary needs (Rahmanova, 2025).

At the same time, public accountability requirements have intensified. Universities, including PTKIN, are expected to demonstrate measurable performance in every sector, including library management. Within this context, the approach of Data-Driven Decision Making (DDDM) has become particularly relevant. DDDM emphasizes the systematic, accurate, and comprehensive use of data as the basis for decision-making, transforming library management from an intuitive or reactive practice into one that is proactive and strategic (Kaspi & Venkatraman, 2023).

In practice, data can cover various aspects, including:

- User behavior: patterns of visits, service preferences, digital access, and literacy needs.
- Collection circulation: the most frequently borrowed materials, the currency of library resources, and their relevance to academic requirements.
- Utilization of digital services: statistics on access to institutional repositories, electronic journals, and e-learning platforms.
- Library staff performance: levels of digital competence, service productivity, and participation in information literacy programs.

By leveraging these data, PTKIN libraries can conduct evidence-based evaluations, identify trends, and design collection development and service strategies that better meet the needs of the academic community. Furthermore, DDDM enables libraries to demonstrate their tangible contribution to realizing the broader vision of PTKIN: producing graduates who excel academically and embody Islamic character (Ahmed Muhammad Rafiq, 2024).

Although the concept of DDDM has been widely applied in the field of educational management (Singgih et al., 2024), in-depth studies on its application within PTKIN libraries remain limited. Most library research in Indonesia tends to focus on aspects such as digital services, information literacy, or technological transformation, but relatively little attention has been given to how data can serve as the foundation for decision-making in library management within PTKIN. This research gap provides the critical space for the contribution of this article.

This article aims to:

- a. Explore the concept of DDDM within the context of PTKIN library management.

- b. Analyze the opportunities and benefits of DDDM implementation for service effectiveness, collection relevance, and user engagement.
- c. Identify challenges in applying DDDM in PTKIN libraries, including limitations in data literacy, technological infrastructure, and organizational culture.
- d. Formulate adaptive and innovative DDDM implementation strategies aligned with Islamic values.
- e. Present case studies of DDDM practices in selected PTKIN in Indonesia as empirical illustrations.

This study is significant for several reasons:

- **Theoretical Contribution:** it expands the discourse on the relevance of Islamic higher education libraries in the digital era by integrating DDDM into the theoretical framework of library management and Islamic literacy.
- **Practical Contribution:** it offers strategic recommendations for PTKIN leaders, librarians, and policymakers to strengthen data-driven library governance.
- **Social and Spiritual Contribution:** it reaffirms the role of PTKIN libraries in shaping a modern, accountable, and future-oriented ecosystem of Islamic education, while remaining firmly grounded in Islamic values.

Concept of Library Management

Library management is the process of managing resources (collections, services, people, technology, and budget) to achieve the goals of education, research, and community service as supported by the institution (Khan & Bhatti, 2021). In the context of higher education, libraries function not only as providers of information but also as learning centers that foster literacy, creativity, and innovation (M.S. GIRISH RATHOD, 2025) (Ramli, 2024).

According to (Noorhayati & Fahyuni, 2024), effective management must be based on rational, information-driven, and results-oriented decision-making. This principle is highly relevant for academic libraries, including Islamic Higher Education Institutions (PTKIN), which face pressures to demonstrate accountability and service effectiveness.

In Indonesia, PTKIN library management is also influenced by national regulations such as the National Standards for Academic Libraries (Rodin, 2022), which emphasize service quality, availability of collections, and the utilization of information technology.

Digital Transformation of Libraries

Digital transformation has shifted libraries from institutions focused on physical collections into technology-based information service centers. According to (Nahotko et al., 2023), digital libraries enable open access, integration of information sources, and the use of data analytics. This

shift requires not only infrastructural changes but also more adaptive librarian skills in handling technology.

Some global trends in digital library transformation include:

- Open Access & Institutional Repository: enhancing the visibility of university research (Puspita et al., 2024).
- Artificial Intelligence (AI) and Big Data: analyzing user behavior to improve service personalization (Patil, 2025).
- Mobile Library Service: providing access to information through smart devices (Cao et al., 2018).
- Digital Literacy: equipping students with the ability to evaluate and use information ethically (Rosyadi et al., 2024).

In the PTKIN context, digital transformation is not merely technological adoption but also an effort to strengthen digital-based Islamic literacy. PTKIN repositories now widely contain Islamic scholarly works, digitized classical texts, and multimedia-based da'wah content (Fitriana Rusdi, 2024).

Data-Driven Decision Making (DDDM)

Definition and Characteristics

Data-Driven Decision Making (DDDM) is a decision-making approach that emphasizes the use of accurate, valid, and relevant data to formulate policies and strategies (Mandinach, 2012). The main principle of DDDM is to replace intuition alone with verifiable empirical evidence. Key characteristics of DDDM according to (Dunn et al., 2013):

- Evidence-based: all policies are supported by clear data.
- Analytical: use of statistical methods, big data, or behavioral analysis.
- Participatory: involving stakeholders in data interpretation.
- Solution-oriented: data serves not merely as reports but as a foundation for continuous improvement.

DDDM in Higher Education

International studies show that DDDM has been widely applied in higher education to improve academic quality, management efficiency, and accountability (Jim & Chang, 2018). For instance, universities in the United States use student data analytics to reduce dropout rates (Doneva et al., 2021). In libraries, DDDM is applied to:

- Analyze borrowing patterns and e-resource usage.
- Measure the effectiveness of information literacy programs.
- Evaluate staff performance and budget allocation (Sarioguz, 2024).

In Indonesia, DDDM studies are relatively new. Research by (Arksey & O'Malley, 2005) highlights that data-driven decision-making in academic libraries can enhance service efficiency and management transparency, though challenges remain in terms of librarians' data literacy and infrastructure limitations.

Application of DDDM in PTKIN Libraries

Opportunities

Enhancing collection relevance: borrowing and digital access data can guide collection development aligned with student needs.

Strengthening information literacy: data on students' information skills can inform literacy programs.

Public accountability: data-driven reports can support institutional accreditation.

Challenges

- Limited data literacy among librarians (Sakhawat et al., 2021).
- Uneven technological infrastructure across PTKIN.
- Organizational culture that relies more on leadership intuition than on data.
- Ethical concerns in data use: student data management must respect privacy (Sakhawat et al., 2021).

Integration of Islamic Values in DDDM

One distinctive feature of PTKIN libraries is the integration of modern knowledge with Islamic values. The principles of DDDM can be connected to Islamic teachings that emphasize evidence-based knowledge (*al-bayyinah*) and trustworthiness (*amanah*) in managing data.

- 'Adl (justice): data-driven decisions ensure fairness in the distribution of library services.
- Shura (consultation): data interpretation should involve stakeholders (faculty, students, librarians).
- Maslahah (public benefit): data should be used for the collective good, not merely for bureaucratic purposes.

Thus, the implementation of DDDM in PTKIN libraries is not only technical but also a moral and spiritual responsibility in managing knowledge (Suwarno, 2022) (Suwarno, 2022).

Related Case Studies

International studies:

- Chen et al. (2020): use of big data in personalizing library services in China.(Suwarno, 2022)
- Cox (2018): challenges of digital libraries in the era of data analytics in Europe.(Azam & Ahmad, 2024)
- Baer & Campbell (2012): application of DDDM in higher education to reduce student dropout rates.(Daniel, 2015)

Studies in Indonesia:

- Hidayat (2021): application of data analytics in UGM library.
- Siregar (2021): digital literacy in PTKIN libraries.
- Rahman (2022): the role of Islamic libraries in strengthening digital-based religious literacy.(Ginting et al., 2022)

Theoretical Framework

This study integrates three approaches:

- Library Management Theory (Khan & Bhatti, 2021): examining management functions (planning, organizing, actuating, and controlling) within library contexts.
- DDDM Model ((Khan & Bhatti, 2021)): describing stages of data collection, analysis, interpretation, and use in decision-making.
- Islamic Values in Knowledge (Abdurrofi, 2025): serving as a normative framework to ensure DDDM practices align with principles of justice, trust, and public benefit.
- Narrative Theoretical Framework
- Input: User data, collection data, service data →
- Process: Data analysis using DDDM principles and integration of Islamic values →
- Output: Management decisions (collection development, service improvement, librarian training) →
- Outcome: Effective, relevant, and Islamic PTKIN libraries.

Research Methodology

Research Design

This study employs a qualitative approach with an exploratory case study design. This approach was chosen because the issue of Data-Driven Decision Making (DDDM) in library management at State Islamic Higher Education Institutions (PTKIN) is still relatively new, complex, and requires in-depth exploration.

According to (Yin, 2018), case studies are highly relevant when researchers aim to understand contemporary phenomena within real-life contexts, especially when the boundaries between the phenomenon and the context are not clearly defined. In this study, the case study method was selected

to explore how PTKIN libraries are transforming through data-driven management, and how opportunities, challenges, and implementation strategies of DDDM are realized in managerial practices.

This research also combines document analysis and in-depth interviews, thereby producing data triangulation to strengthen the validity of the findings.

Research Sites and Subjects

The research was conducted in three PTKIN in Indonesia, selected purposively based on variations in institutional conditions and the development of library technology, namely:

Institut Agama Islam Negeri (IAIN) Curup

The IAIN Curup Library was chosen because it is currently developing an automation system using SLiMS and integrating digital services into the campus academic system.

Universitas Islam Negeri Fatmawati Sukarno (UIN FAS) Bengkulu

The UIN FAS Library has a vision of digital service modernization and has developed an institutional repository based on OJS as well as an e-library service to support research.

Universitas Islam Negeri Raden Fatah (UIN RF) Palembang

The UIN RF Library has a large capacity with a relatively advanced digital collection and has adopted data analytics systems in managing collections and monitoring the use of electronic resources.

The selection of these three sites allows for a contextual comparison between small-to-medium-scale PTKIN (IAIN Curup) and large-scale institutions (UIN RF), as well as one undergoing transition toward a smart library (UIN FAS).

Data Collection Techniques

Data were collected through three main methods:

In-depth Interviews

Main informants: Library directors, senior librarians, IT staff, and several faculty members/students as primary users.

Interview focus:

- Understanding and practice of DDDM in library management.
- Technical and non-technical barriers in implementation.
- Strategies for data development and integration of digital services.
- Number of interviews: ±15 people (5 per campus).

Participant Observation

The researcher conducted direct observations of the use of digital services, circulation systems, e-journal access, and integration with campus academic systems.

Observation lasted for 2 months at each library.

Document Analysis

Analyzed documents include annual library reports, statistical data on visits and loans, digital collection management policies, and PTKIN strategic planning documents related to digitalization.

Research Instruments

The main instrument of the research is the researcher, acting as the key instrument (Matthew B. Miles, A. Michael Huberman, 2014). To strengthen data collection, the researcher used:

- Semi-structured interview guides.
- Observation sheets related to digital library service activities.
- Document analysis matrices to identify patterns of data utilization.

Data Analysis Techniques

Data were analyzed thematically following the steps proposed by (Naeem et al., 2023):

- Data Familiarization – Re-reading interview transcripts, observation notes, and documents.
- Generating Initial Codes – Assigning codes to data units related to DDDM, challenges, opportunities, and implementation strategies.
- Searching for Themes – Grouping codes into broader themes, such as “organizational culture resistance,” “need for data literacy,” and “system integration strategies.”
- Reviewing Themes – Re-examining the themes against the entire dataset.
- Defining and Naming Themes – Formulating the final themes and their descriptions.
- Producing the Report – Presenting findings in the form of narratives, tables, and case analyses.

Validity and Reliability

To ensure data trustworthiness, the study employed triangulation techniques (Ahmed, 2024): Source triangulation: comparing information from librarians, IT staff, faculty, and students. Method triangulation: interviews, observations, and documents. Member checking: confirming findings with informants.

In addition, an audit trail was maintained in the form of field notes, interview transcripts, and documentation to ensure transparency of the research process.

Research Ethics

This study adheres to the ethical code of social-humanities research, including:

- Informed consent: each participant was informed about the research objectives and provided their consent.

- Anonymity: informant identities were anonymized.
- Confidentiality: data were used solely for academic purposes.

Research Limitations

Some limitations of this research design include:

- Research Scope – Limited to three PTKIN, thus restricting generalization.
- Case Study Focus – Concentrating on university libraries, without addressing madrasah or pesantren libraries.
- Time Constraints – Observations conducted for approximately six months, which may not fully capture the long-term dynamics of DDDM implementation.

Nevertheless, this study makes a significant contribution to understanding the transformation patterns of data-driven Islamic libraries and provides a foundation for further studies with broader coverage.

Findings and Discussion,

General Overview of Findings

This study found that the transformation of PTKIN library management toward Data-Driven Decision Making (DDDM) is progressing with varying levels of maturity across the study sites.

In general, three key aspects emerged as the main focus of the findings:

1. Readiness of Digital Infrastructure (software, hardware, network).
2. Librarian Human Resource Capacity and Data Literacy.
3. Management Strategies and Policy Implementation.

Each institution demonstrated different levels of data utilization to support managerial decision-making. Some remain at the early stage of simple data collection, while others have begun integrating data for predictive analysis.

Case Studies by Institution

IAIN Curup

The IAIN Curup Library is still at the early stage of digital transformation. The SLiMS-based library automation system is used for collection management, but integration with the academic system remains limited. Data collection is restricted to loan statistics, visitor counts, and collections, and has not yet been fully optimized for decision-making.

The main challenges include limited human resources with data analysis competence and insufficient funding for infrastructure development. However, there is potential for progress since campus management has shown commitment to strengthening librarians' digital literacy.

UIN Fatmawati Sukarno Bengkulu (UIN FAS)

The UIN FAS Library demonstrates more advanced development. In addition to using an automation system, it already has an institutional repository that supports faculty and student scholarly publications. Repository statistics and electronic journal access data have begun to be used for evaluating collections and services.

The main challenge is the absence of an integrated analytics dashboard, which results in fragmented data. Furthermore, some librarians remain focused on administrative tasks rather than strategic analysis. Nonetheless, strong support from the rectorate through the digitalization roadmap presents a significant opportunity.

UIN Raden Fatah Palembang (UIN RF)

As a large-scale library, UIN RF has adopted a more sophisticated digital library management system. Access to international journals, e-books, and user statistics is already used as the basis for decision-making, such as in determining e-resource subscriptions.

The library has developed an internal data analytics system to monitor usage patterns of collections, thereby enabling more evidence-based investment decisions in digital collections. Remaining challenges include resistance from some staff to organizational culture change, as well as the need to further strengthen data literacy among users.

Comparative Case Study Table

The following table presents a comparison of DDDM implementation across the three libraries:

Table 1. Comparison of DDDM implementation across the three libraries

Aspect	IAIN Curup	UIN FAS Bengkulu	UIN RF Palembang
Digital Infrastructure	Uses SLiMS, minimal integration	SLiMS + Institutional Repository, no dashboard yet	Advanced digital system, already has internal analytics
Data Utilization	Basic statistics (visits, loans)	Repository & journal access statistics, collection evaluation	User analytics for subscriptions & collection development
Human Resource Capacity	Limited librarians, low data literacy	Librarians starting to engage, but mostly administrative-focused	Competent librarians, some already trained in data literacy
Management Support	Initial commitment from campus leadership	Digitalization roadmap in place, supported by rectorate	Strong support, integrated into university strategy
Key Challenges	Limited HR and budget	Fragmented data, lack of analytics dashboard	Organizational culture resistance, need for enhanced data literacy
Development Opportunities	HR training & system integration	Dashboard development & data integration	Strengthening predictive analytics & data-driven research collaboration

Discussion

The findings of this study indicate that the implementation of DDDM in PTKIN libraries is strongly influenced by three key factors:

1. Digital Infrastructure

The stronger the digital infrastructure, the greater the potential for utilizing data to support management. UIN RF stands out because it already has an internal analytics system, while IAIN Curup remains limited.

2. Human Resource Capacity and Data Literacy

According to the Association of College and Research Libraries (ACRL, 2022), data literacy is a critical skill for 21st-century librarians (Guidebook, 2025). All three libraries show a significant need to enhance this skill so that data is not only collected but also analyzed to support strategic decision-making.

3. Management Support

Campus leadership support plays a central role in determining the direction of library digitalization policies. When the rectorate provides a clear roadmap, as seen at UIN FAS, the transformation becomes more structured.

Thus, it can be concluded that the transformation toward data-driven library management is not merely a technical matter, but also a managerial, cultural, and institutional policy issue.

Comparison of Field Findings with Theory

1. Theory of Data-Driven Decision Making (DDDM) and Its Practice in PTKIN

(Brynjolfsson & McElheran, 2016) argue that organizations adopting DDDM tend to perform better because decisions are based on facts rather than intuition alone. In the library context, (Tenopir, 2015) emphasize that data on collection usage, digital access, and information-seeking patterns can serve as the basis for collection development and service policies.

- Field Findings:

- IAIN Curup still relies on simple descriptive data, which corresponds to the early stage of DDDM (descriptive analytics).
- UIN FAS has entered the diagnostic analytics stage by using repository and journal access data to evaluate collections.
- UIN RF has advanced further, approaching predictive analytics, by using usage pattern data to project collection needs.

The DDDM theory proves relevant, but its application varies depending on each campus's capacity. This difference highlights the *digital divide* among PTKIN, aligning with (Warschauer,

2003) view that digital inequality is not only about access to technology but also about competence and institutional support.

2. Change Management Theory

Kotter (1996) emphasizes that organizational transformation requires urgency, a shared vision, and leadership commitment. In the library context, (Angadi, 2021) note that top management support is the most decisive factor in the success of digitalization and service innovation.

○ Field Findings:

- IAIN Curup has only shown initial leadership commitment, so change remains partial.
- UIN FAS has a rectorate-led digitalization roadmap, consistent with Kotter's stage of "building vision and strategy."
- UIN RF is more advanced because digitalization has already been integrated into the university's strategy, consistent with the stage of "anchoring new approaches in the culture."

Change management theory is highly contextual in explaining the differences in progress across campuses. The stronger the leadership support and the clearer the roadmap, the faster the adoption of data-driven digitalization.

3. Human Resource Capacity and Data Literacy Theory

ACRL (2022) stresses that data literacy is an essential 21st-century librarian competency, encompassing skills in collecting, analyzing, and interpreting data. This aligns with (Flynn, 2023) in Indonesia, who argues that librarians should become *data managers*, not merely *information keepers*.

○ Field Findings:

- IAIN Curup: low data literacy, librarians focus on routine administration.
- UIN FAS: librarians are involved in data management, but analytical orientation remains limited.
- UIN RF: some librarians are already trained in data analysis, though organizational culture resistance persists.

Data literacy theory highlights the competence gap among librarians. Field evidence reinforces the importance of systematic training programs and professional development in data analytics.

4. SDGs Framework and Libraries

IFLA (2017) emphasizes that libraries play a crucial role in supporting the Sustainable Development Goals (SDGs), particularly SDG 4 (quality education) and SDG 9 (infrastructure, industry, and innovation).

- Field Findings:
 - IAIN Curup contributes only to SDG 4 through basic services.
 - UIN FAS has begun supporting SDG 9 through repositories and journal access as research infrastructure.
 - UIN RF supports both SDG 4 and SDG 9 by leveraging data analytics for academic service innovation.

The field findings confirm the validity of the library-SDGs framework, though implementation remains gradual. PTKIN libraries could become *centers of excellence* in supporting SDGs if data-driven transformation is consistently pursued.

5. Local vs. Global Perspective

In international literature, such as (Andrew M. Cox, 2017), research libraries in Europe and the U.S. have already positioned data as a strategic asset in long-term planning. However, in Indonesia, Sulisty-Basuki (2019) points out that library digital transformation is often constrained by regulations, budgets, and organizational culture.

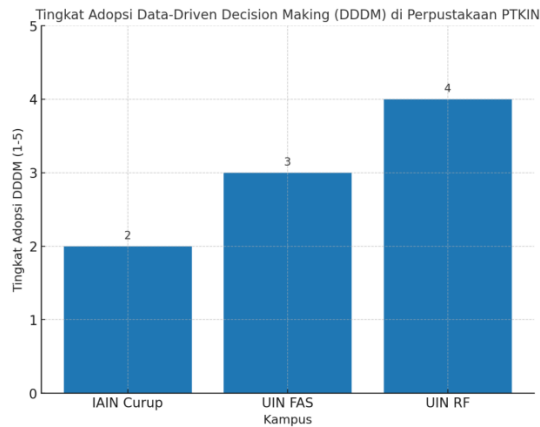
- Field Findings:
 - The three PTKIN cases reflect the Indonesian context, where digital transformation progresses unevenly.
 - Local barriers (HR, infrastructure, budget) are highly influential, making it necessary to adapt international theories to domestic conditions.

The gap between global practices and local realities underscores the need for a contextual approach. International theories can serve as references, but implementation must account for the social, economic, and cultural realities of institutions in Indonesia.

Synthesis of Analysis

Based on the comparison between theory and field findings, the following conclusions can be drawn:

- Theory–Practice Alignment. The theories of DDDM, change management, and data literacy are proven relevant in explaining the development of PTKIN libraries.
- Implementation Gap. There are significant discrepancies between the ideal theories and field practices, particularly in terms of human resources and infrastructure.
- Opportunities for Adaptation. PTKIN libraries can use global theories as inspiration, but local adaptation is essential to ensure that transformation strategies are realistic.



Picture 1: The Level of Adoption of Data-Driven Decision Making (DDDM) in the Libraries

The graph above illustrates the level of adoption of Data-Driven Decision Making (DDDM) in the libraries of three PTKIN campuses. It shows that IAIN Curup is still at the initial stage (score 2), UIN FAS Bengkulu is developing (score 3), while UIN RF Palembang demonstrates a more advanced level of adoption (score 4).

Conclusion and Suggestion

Conclusion

The study concludes that the implementation of Data-Driven Decision Making (DDDM) has become a strategic driver for transforming library management at Islamic Higher Education Institutions (IAIN Curup, UIN FAS Bengkulu, and UIN RF Palembang). DDDM shifts library governance from a reactive model to a proactive, analytical, and value-based system, where data functions as a key instrument for planning, evaluation, and innovation.

In the PTKIN context, DDDM is not only a managerial framework but also an ethical practice that integrates Islamic values such as amanah, transparency, and masalah in decision-making processes. Empirical evidence shows that the three institutions are at different stages of DDDM maturity but share a common trajectory toward digital transformation and adaptive management.

Overall, DDDM enhances service quality, accountability, user engagement, and institutional effectiveness, contributing to PTKIN's mission to produce academically excellent and spiritually grounded graduates. Nevertheless, challenges remain in terms of data literacy, infrastructure readiness, and the absence of national standardization—issues that must be addressed to ensure sustainable implementation.

Suggestions

1. For Library Practice

- Strengthen librarians' data literacy through continuous professional training and collaboration with data and information science experts.

- Develop integrated library systems that connect with academic, research, and e-learning platforms.
 - Formulate ethical guidelines for data utilization grounded in Islamic principles to ensure responsible and value-oriented management.
2. For Institutional and National Policy
- The Ministry of Religious Affairs and other relevant bodies should support digital infrastructure enhancement and provide access to data analytics tools.
 - Establish a national framework and standards for DDDM implementation across PTKIN libraries.
 - Create certification programs for librarians focusing on data literacy, analytics, and information management.
 - Institutionalize DDDM within PTKIN strategic plans to reinforce its role in education, research, and community service.
3. For Future Research
- Conduct longitudinal studies to track the sustainability and evolution of DDDM practices.
 - Employ qualitative or ethnographic methods to explore organizational culture, resistance, and adaptation in digital transitions.
 - Perform comparative studies with Islamic higher education libraries in other countries to identify global best practices.
 - Investigate the integration of AI and Big Data technologies to strengthen predictive and strategic decision-making in PTKIN libraries.

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